10. The Asia Pacific Region

Discussion Leader: James Mulvenon

Rapporteur: James Dewar

A Framework

The Asia Pacific group decided early on that some careful definitions were important to the discussion of the impact of the Information Revolution in the Asia Pacific region. Those discussions produced relationships among three concepts -- *technology, artifact* and *usage* -- as shown in Figure 10.1:

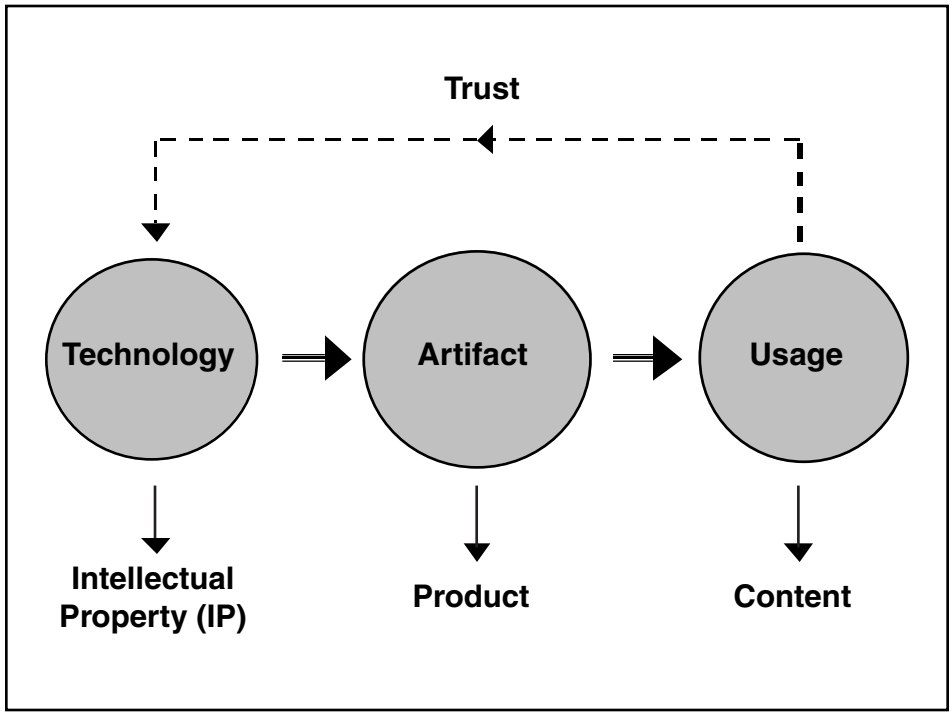

Figure 10.1 Technology, Artifact, and Usage

Technology, here, refers to the idea or intellectual property behind the *artifact* or *product* that embodies it. The distinction here is between countries that have the

intellectual capital to create products and countries that are primarily factories or producers of products that were developed elsewhere.

In the simplest terms, the *usage* or *content* concept refers primarily to the consumer market for the technologies and artifacts developed. In this regard, the term "usage" is being used literally to refer to consumers using the products and technologies. Usage engenders "content" because that is often developed locally in each consumer market to suit the tastes or habits of the local market.[33] So content varies and depends on the usage or marketplace. That this item (Usage) requires "trust" simply means that people trust that the gadgets they are relying increasingly on function correctly, will continue to do so, and will remain available.

The group talked about where countries in the region are now and what “branch points” may lead them to become significantly different in the future. It was clear from the discussion that branch points may be very different for different countries in the region.

Asia Pacific Defining Characteristics

Before working on sub-regional aspects of the Information Revolution, the group worked to characterize the Asia Pacific region as a whole in terms of the driving and stunting factors. That led to Table 10.1:

---

[33] For example, the IBM PC is an artifact which is shipped globally. However, the content or software loaded onto it varies depending on to whom the PC is being shipped.

Table 10.1

Driving and Stunting Factors

	Technology (Intellectual Property)	**Artifact (Product)**	**Usage (Content)**
Driving Factors	• Education • Equity capital access • Venture spirit • Local market potential	• Tax policy • Plentiful, low-cost labor • "ISP" effect	• Consumer wealth • Taxation policy • "ISP" effect • Quality and availability of service
Stunting Factors	• Over regulation • Government policy • Intellectual property right violations • Monopolies	• Low mfg./process technology • Distribution and sourcing • Legacy systems	• Censorship • Lack of credit • Trust of product • Language

Since almost any entry in the table can be either a driving or a stunting factor the table should be read as follows: Countries/areas with high education, good access to equity capital, a venture spirit and good local market potential are good candidates to become technology providers AND in the Asia Pacific in general, these conditions hold. Similarly, over regulation, disadvantageous government policies, poor handling of intellectual property rights violations and disruptive monopolies will all work to stunt a country/area from becoming a technology provider AND these are certainly in evidence in the Asia Pacific region. How those factors play out in an individual country/area was left until later in the discussion.

Most of the remaining table entries are self explanatory with the exception of the "ISP" effect. This is the ability of an individual or small group to have a quick, disproportionately large effect (as in the early Internet Service Providers). The language stunting factor under *usage* worried about too much of the Information Revolution content being in English for the Asia Pacific region to take quick or easy advantage.

Given the above table, the group further generalized four defining characteristics of the Asia Pacific region with the respect to the Information Revolution:

- Asia Pacific governments actively try to engineer Information Revolution outcomes/directions (and most will be unsuccessful)
- Asia Pacific suffers from a net brain drain in the technology arena (and this is likely to continue)
- Usage in the region will go up significantly
- The Asia Pacific region will be a net software consumer and a net hardware producer for the foreseeable future

Country-by-Country Assessment

The group then turned to sub-regional assessments by country or area. This led to Table 10.2:

There's a good deal of information in the table. We will walk through the entries in the order in which they were discussed. The first point of discussion was the manner in which the region should be broken up. The areas shown in the table were ultimately decided on as being most similar (if grouped) and likely to be or behave differently from other areas.

Chronologically, the next topic of discussion was where each of the areas in the table were today regarding each of the three framework topics (i.e., technology, artifact, and usage). A judgement was made here assigning *high, medium,* or *low* values to each of these topics for each of the areas. For example, Korea was judged to be *low* in technology and *high* in artifact because it is a leading manufacturer and exporter of artifacts, but does not develop the underlying technologies for those products and is not a product innovator. Korea was judged to be *medium* in its use of information technology and products. Similar judgements were made for the other areas shown in the table. The group then adjusted the ratings to give Taiwan a *medium-plus* in technology and a *medium-minus* in usage and to give Oceana a *medium-plus* in usage.

Table 10.2

Country-by-Country Assessment

	Predictability[34]	Technology (IP)	Artifact (Product)	Usage (Content)
Japan	P	High ⇨⇨	High ⇨	Medium ⇨
Korea	MP	Low	High	Medium
China	P	Low ⇨⇨	High ⇨	Low ⇨
Hong Kong	P	Low ⇨⇨	Low ⇨	High ⇨⇨
Taiwan	MP	Medium +	High	Medium –
Singapore/ Malaysia	P	Low ⇨⇨	Medium ⇨⇨	Medium ⇨
SE Asia	UP	Low	Medium	Low
Oceana[35]	P	Medium ⇨	Low ⇨	Medium + ⇨

The group then turned to a discussion of the future and made two judgements. The first judgement was determining how predictable the group thought the various areas were. That is, how reliably did the group think it could project what would happen in each area for each of the three framework topics (technology, artifact, and usage) out to roughly to the year 2020. These judgements are reported in the second column of the table. Surprisingly, the group thought most of the areas were relatively predictable *with respect to the Information Revolution.* No one was willing to predict the geopolitical climate in 2020, but thought that the progress of the Information Revolution would be relatively insensitive to geopolitical and other changes. *The one serious caveat was that there would be no war in the Asia Pacific region in the coming 20 years*. If there were a war, all bets would be off.[36] Only Korea (medium predictable), Taiwan (medium predictable), and SE Asia (unpredictable) came out other than predictable.

The second judgement regarding the future then looked at those areas that were considered predictable and predicted in what direction the group thought an area would go with respect to each of the three factors over the next 20 years. In the above table, ⇨means the group definitely thought that there would be an increase in that

---

[34] P = Predictable, MP = Medium Predictable, UP = Unpredictable.

[35] Including Australia and New Zealand.

[36] In this case, the group decided it should be reconvened to project the future again!

factor in that area. In China, for example, which the group judged to be high already in artifact production, the consensus was that China would be even more of a factor in artifact production in the future. A ⇨means the group thought there would be some movement, ⇨⇨ means the area will remain at its current level, ⇨means a slight decrease and ⇨means the group thought there would definitely be a decrease in that factor for that area. In Hong Kong, for example, the group thought there would be even less artifact production in the future.

Technologies That Could Make a Difference

The final action of the group was to identify technologies that they thought would make a big difference in the Asia Pacific region. Six such technologies were identified:

- Non-electric-based computing (or room temperature superconducting). The idea here was that much of the Asia Pacific region has rudimentary or no electricity (and that this is a significant constraint to computer use), so computing that depended very little on electricity could make a big difference.
- Machine translation (or non-von Neuman machines). Because of the many languages in the area and the predominance of English on the Internet, machine translation (or non-von Neuman machines that would allow brute force solutions to machine translation) could drive usage.
- LEO (Low Earth Orbit) ubiquity. These would be satellites that would allow full global coverage at all times. Similar to the first technology, this would allow Internet usage to remote locations.
- PKI (Public Key Infrastructure) for privacy/security and cheap crypto protection. Here the group thought that people in the Asia Pacific region are particularly worried about privacy. More robust security measures may remove significant cultural barriers to Internet usage.
- Digital epidemiology. This is the area that seemed most interesting on the biocomputing front for the Asia Pacific region. Because of the population densities, a wide set of sensors could detect illness outbreaks quickly, then molecular engineering/breeding techniques could be used to create tailored remedies rapidly.
- Non-silicon-based chips. It was thought that this might facilitate fabrication technologies in this artifact production-rich area of the world.